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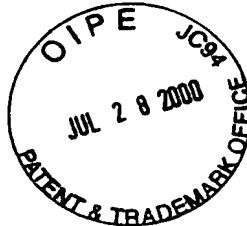
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YAMASHITA ET AL.

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Examiner: Sajous, W.

For: PROGRAM-GUIDE-DISPLAY CONTROLLING APPARATUS AND TELEVISION RECEIVER

VERIFICATION OF A TRANSLATION

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

I, the below named translator, hereby declare that:

My name and post office address are as stated below;

That I am knowledgeable in the English language and in the Japanese language and believe the attached English translation to be a true and complete translation of the certified copy of Japanese application number Hei. 8-109017, filed on April 30, 1996.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and

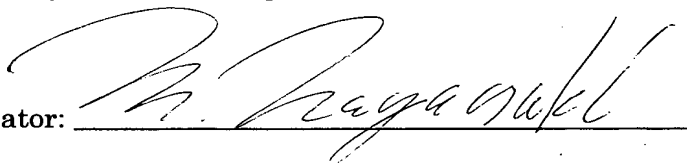
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further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, and that such will full false statements may jeopardize the validity of the application or any patent issued thereon.

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PROGRAM-GUIDE-DISPLAY CONTROLLING APPARATUS AND
TELEVISION RECEIVER

[Number of claims] 5

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[Title of the Invention]

PROGRAM-GUIDE-DISPLAY CONTROLLING APPARATUS AND
TELEVISION RECEIVER

[CLAIMS]

[Claim 1]

A program-guide-display controlling apparatus for displaying a plurality of program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising:

means for displaying to discriminate a time zone in which a purchased program is present and a time zone in which the purchased program is not present.

[Claim 2]

A program-guide-display controlling apparatus for displaying a plurality of program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising:

means for displaying in different colors a program guide belonging to a time zone in which a purchased program is present and a program guide belonging to a time zone in which the purchased program is not present among program guides displayed on said display unit.

[Claim 3]

A program-guide-display controlling apparatus for displaying some program guides of all program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising:

means for displaying such that, if a program guide concerning a program which has been purchased is included in each of the program guides displayed on said display unit, that program guide can be discriminated to be a program guide concerning a program which has not been purchased; and

means for displaying a mark indicating a direction of the channel axis and a direction in which a channel of a purchased program is present in a region corresponding to said time zone in a display region of said display unit if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on said display unit, and the purchased program guide is not displayed on said display unit.

[Claim 4]

A program-guide-display controlling apparatus for displaying a plurality of items of program guide information on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising:

means for displaying a bar if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on said display unit, said bar being displayed in a region corresponding to said time zone in a display region of said display unit.

[Claim 5]

A television receiver provided with the program-guide-display controlling apparatus according to any one of claims 1 to 4.

[Detailed Description of the Invention]

[0001]

[Technical Filed]

The present invention relates to a program-guide-display controlling apparatus for displaying a program guide necessary for selecting a program desired by a user from a plurality of channels in a television broadcasting, and a television receiver.

[0002]

[Background Art]

In the digital satellite broadcasting system (DSS) which has been put to commercial use in the United States, a multiplicity of more than 150 channels are available, and very numerous programs are being provided. In this system, guide information on programs which are presently being broadcast and programs which will be broadcast in the future is

transmitted at predetermined time intervals together with primary program data. A user-side terminal has a function of displaying a program guide screen (program guide table) on the basis of the program guide information.

[0003]

As shown in Fig. 10, a partial program guide table of an entire program guide table E corresponding to the entire program guide information received is displayed as a program guide screen on the user-side terminal. A plurality of program guides are displayed on the program guide screen in a matrix form by using the ordinate as a channel number axis and the abscissa as a time axis. In this example, programs on five channels for a period of two hours and a half are displayed on the program guide screen. At the left end, channel numbers are displayed in a vertical arrangement. Frames which indicate the time zones of programs which are broadcast on the respective channels are displayed in rows corresponding to the respective channels, and titles (A to P) are displayed in the respective frames.

[0004]

The display screen is scrolled vertically or horizontally as the user operates a cursor, thereby making it possible to display other portions of the program guide table within the entire program guide table E.

[0005]

[Problems that the Invention is to Solve]

Programs which are provided in the DSS include no-charge programs which can be viewed free of charge if the user pays a system utilization fee, including a charge for subscribing to the DSS, a basic fee, and the like, as well as chargeable programs for which fees are charged separately from the system utilization fee. In addition, the chargeable programs include those which the user purchases in advance in units of channels, and those for which fees are charged only when the programs are viewed (PPV: pay per view). To view a PPV program, a procedure for purchase must be taken on the television screen before the program is started or when that program is being broadcast.

[0006]

To purchase a PPV program, a PPV program to be purchased is selected from a program guide table displayed on the television screen shown in Fig. 10. Then, since a purchase procedure screen is displayed, a purchase procedure is taken in accordance with the instructions on the screen.

[0007]

Since the user has not necessarily memorized accurately the purchased PPV program, there are cases where the user happens to purchase by subscription two or more PPV programs which are broadcast in the same time zone. In addition, in a case where a plurality of users are present for one user-side

terminal, there is a high possibility that the user happens to purchase by subscription two or more PPV programs which are broadcast in the same time zone for one user-side terminal.

[0008]

An object of the present invention is to provide a program-guide-display controlling apparatus and a television receiver in which the situation is made unlikely to occur in which two or more PPV programs which are broadcast during the same time zone happen to be purchased.

[0009]

[Means for Solving the Problems]

In accordance with a first aspect of the present invention, there is provided a program-guide-display controlling apparatus for displaying a plurality of program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising means for displaying to discriminate a time zone in which a purchased program is present and a time zone in which the purchased program is not present.

[0010]

In the program-guide-display controlling apparatus in accordance with the first aspect of the present invention, since display is provided to discriminate the time zone in which a purchased program is present and the time zone in which the purchased program is not present, the user is able to

immediately know a time zone in which a purchased program is present, through the program guide screen. For this reason, it is possible to prevent a situation in which two or more programs are purchased by mistake for the same time zone.

[0011]

In accordance with a second aspect of the present invention, there is provided a program-guide-display controlling apparatus for displaying a plurality of program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising means for displaying in different colors a program guide belonging to a time zone in which a purchased program is present and a program guide belonging to a time zone in which the purchased program is not present among program guides displayed on the display unit.

[0012]

In the program-guide-display controlling apparatus in accordance with the second aspect of the present invention, since a program guide belonging to a time zone in which a purchased program is present and a program guide belonging to a time zone in which the purchased program is not present are displayed in different colors among program guides displayed on the display unit, the user is able to immediately know a time zone in which a purchased program is present, through the program guide screen. For this reason, it is possible to prevent

a situation in which two or more programs are purchased by mistake for the same time zone.

[0013]

In accordance with a third aspect of the present invention, there is provided a program-guide-display controlling apparatus for displaying some program guides of all program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising means for displaying such that, if a program guide concerning a program which has been purchased is included in each of the program guides displayed on the display unit, that program guide can be discriminated to be a program guide concerning a program which has not been purchased, and means for displaying a mark indicating a direction of the channel axis and a direction in which a channel of a purchased program is present in a region corresponding to the time zone in a display region of the display unit if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on the display unit, and the purchased program guide is not displayed on the display unit.

[0014]

In the program-guide-display controlling apparatus in accordance with the third aspect of the present invention, the user is able to immediately know a time zone in which a purchased

program is present through the program guide screen. For this reason, it is possible to prevent a situation in which two or more programs are purchased by mistake for the same time zone.

[0015]

Also, since a mark indicating a direction of the channel axis and a direction in which a channel of a purchased program is present is displayed in a region corresponding to the time zone in a display region of the display unit if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on the display unit, and the purchased program guide is not displayed on the display unit, it is easier to retrieve the purchased program.

[0016]

In accordance with a fourth aspect of the present invention, there is provided a program-guide-display controlling apparatus for displaying a plurality of items of program guide information on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis, comprising means for displaying a bar if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on the display unit, the bar being displayed in a region corresponding to the time zone in a display region of the display unit

[0017]

In the program-guide-display controlling apparatus in accordance with the fourth aspect of the present invention, if a time zone in which a purchased program is present is included in the time zone of a program guide displayed on the display unit, a bar is displayed in a region corresponding to the time zone in a display region of the display unit. For this reason, it is possible to prevent a situation in which two or more programs are purchased by mistake for the same time zone..

[0018]

A television receiver of the present invention is provided with a program-guide-display controlling apparatus according to any one of claims 1 to 4.

[0019]

[Mode for Carrying Out the Invention]

Referring now to the drawings, a description will be given of an embodiment in a case where the present invention is applied to the digital satellite broadcasting system (DSS) which has been put to commercial use in the United States.

[0020]

[1] Configuration of user-side terminal

[0021]

Fig. 1 shows a configuration of a user-side terminal.

[0022]

A combination of a television receiver and a

program-guide-display controlling apparatus, or a television receiver incorporating a program-guide-display controlling circuit is used as the user-side terminal. The user-side terminal has a CPU 6 for controlling the overall user-side terminal. The CPU 6 has a storage device 9 for storing its program and necessary data. An operation unit 5 comprising a remote controller or the like is connected to the CPU 6. The CPU 6 controls a tuner 2 for displaying a program selected by the operation unit 5, and controls a program-guide-image generating circuit 4 for generating a program guide image.

[0023]

A high-frequency signal from an unillustrated parabolic antenna is inputted to an input terminal 1. The signal inputted to the input terminal 1 is sent to the tuner 2. In the tuner, processing such as frequency conversion, QPSK demodulation and the like is effected, and a stream of digital video signals is generated. An output from the tuner 2 is sent to a video processing circuit 3.

[0024]

In the video processing circuit 3, the stream outputted from the tuner 2 is MPEG decoded, and an analog video signal for displaying on a display unit 8 such as a CRT, e.g., an NTSC signal, is generated. This video signal is sent to the display unit 8 through a multiplexer 7 so as to be displayed on the display unit 8.

[0025]

In the video processing circuit 3, program guide information is extracted from the output from the tuner 2, and is supplied to the CPU 6. The program guide information supplied to the CPU 6 is stored in the storage device 9. Set screen information for displaying various set screens such as a menu screen is stored in advance in the storage device 9, and information concerning programs which have been purchased (purchased programs) and the like are also stored therein.

[0026]

The program-guide-image generating circuit 4 has a display memory (not shown). In the program-guide-image generating circuit 4, various set images and program guide images are formed on the display memory on the basis of the set screen information, the program guide information, and the like which are stored in the storage device 9. Then, the images formed on the display memory are consecutively read, and are sent to the display unit 8 through the multiplexer 7 so as to be displayed on the display unit 8. On the basis of a control signal from the CPU 6, the multiplexer 7 selects one of the output from the video processing circuit 3 and the output from the program guide image generating circuit 4, and supplies it to the display unit 8.

[0027]

The operation unit 5 is provided with a menu key 11 for

displaying the menu screen, four cursor movement keys 12L, 12R, 12U, and 12D for moving a cursor horizontally and vertically, a select key 13 for selecting and inputting, and the like. When the user wishes to view a program guide screen, it suffices that the user operates the menu key 11 to display the menu screen, and then selects a program guide by operating the cursor movement keys 12L, 12R, 12U, and 12D and the select key 13.

[0028]

[2] Process for displaying the program guide screen

[0029]

The program guide information sent to the receiver includes guide information on the programs for all the channels from the present time to the time 24 hours ahead, for example. The program guide information on one program includes a title, its fee (rating) if the program is a PPV program, the category (sports, music, drama, news, etc.), the starting time, the ending time, and so on.

[0030]

The CPU 6 regards the guide information on the programs for all the channels as being two-dimensionally arranged information in which the channel numbers are set in the vertical direction and the time is set in the horizontal direction as shown on the upper side in Fig. 10, and the CPU 6 generates an index table which can be accessed by using the channel numbers and slot numbers indicating the time. The slot numbers

are numbers which are allotted in units of 30 minutes, for example. Incidentally, the two-dimensionally arranged region corresponding to the entire program guide information shown on the upper side in Fig. 10 will be referred to as an entire program guide region.

[0031]

If a program guide display is selected by the operation unit 5, the CPU 6 generates a display table such as the one shown in Fig. 2 on the basis of the channel number selected immediately before then, the present time, and the index table. In Fig. 2, the program guide display information is stored in small regions (hereafter referred to as slots) in the region excluding the leftmost column. Accordingly, in this example, a display table corresponding to a 5 channels X 5 slots portion (corresponding to two hours and a half) of the program guide is generated. The channel numbers (absolute channel numbers) or data on the station names corresponding to those channel numbers are stored in the slots in the leftmost column.

[0032]

In Fig. 2, x in (x, y) described as an index in each slot denotes a relative channel number (a relative channel number among the slots in the display table, and not an absolute channel number), and y denotes a relative slot number (a relative slot number among the slots in the display table, and not an absolute slot number). The program guide display

information corresponding to the channel number selected immediately before then and the present time is stored in a second slot So from the left in an uppermost row (hereafter this slot will be referred to as a reference slot).

[0033]

The program guide display information stored in each slot includes a title, the number of slots in which the program continues (the number of exclusively occupied slots), the rating, information representing whether or not the program has been purchased, the category, and so on. On the basis of the display table thus created, the program-guide-image generating circuit 4 generates on the display memory an image corresponding to the program guide screen such as the one shown on the lower side in Fig. 10. Then, as the image generated on the display memory is sent to the display unit 8, the program guide screen such as the one shown on the lower side in Fig. 10 is displayed on the display unit 8.

[0034]

[2-1] Process executed by the CPU 6 and the program guide image generating circuit 4 when the program guide is selected by the operation unit 5

[0035]

Fig. 3 shows an overall procedure of processing which is executed by the CPU 6 and the program-guide-image generating circuit 4 in the case where the program guide is selected by

the operation unit 5.

[0036]

When the program guide is selected by the operation unit 5, the channel number selected immediately before then and the present time are read, and the reference slot is set from the entire program guide region (Step 1).

[0037]

The display table shown in Fig. 2 is created on the basis of the set reference slot and the index table (Step 2).

[0038]

Information in this display table is sent from the CPU 6 to the program-guide-image generating circuit 4. In the program-guide-image generating circuit 4, program-guide-image generation processing is effected on the basis of the sent information (Step 3). That is, a program guide image is generated on the display memory. As the program guide image generated on the display memory is consecutively read and sent to the display unit 8, a program guide screen is displayed on the display unit 8. Subsequently, the operation is set in a state of waiting for a key input.

[0039]

When there has been a select key input by the select key 11 (YES in Step 4), predetermined selection processing such as the selection of a program, a reservation of a program, and the like is executed.

[0040]

When there has been a cursor key input by the cursor movement keys 12L, 12R, 12U, and 12D (YES in Step 5), processing at Step 6, 7, or 9 is effected in correspondence with the operated cursor movement keys 12L, 12R, 12U, and 12D.

[0041]

In other words, if the operated key is the left movement key 12L, the operation proceeds to Step 6 to determine whether or not there has been a command for leftward movement from the left end of the entire program guide region. If the operated key is the right movement key 12R, the operation proceeds to Step 7 to determine whether or not there has been a command for rightward movement from the right end of the entire program guide region. If the operated key is the upward movement key 12U, the operation proceeds to Step 8 to determine whether or not there has been a command for upward movement from the upper end of the entire program guide region. If the operated key is the downward movement key 12D, the operation proceeds to Step 9 to determine whether or not there has been a command for downward movement from the lower end of the entire program guide region.

[0042]

The cursor cannot be moved if there has been a command for leftward movement from the left end of the entire program guide region (YES in Step 6), if there has been a command for

rightward movement from the right end of the entire program guide region (YES in Step 7), if there has been a command for upward movement from the upper end of the entire program guide region (YES in Step 8), or if then has been a command for downward movement from the lower end of the entire program guide region (YES in Step 9). Hence, the operation returns to Step 4, and is set in a state of waiting for a key input.

[0043]

If the cursor movement command by the cursor key input is not a command which cannot move the cursor as described above, the position of the destination of the cursor movement is calculated (Step 10). Then, a determination is made as to whether or not the position of the destination of the cursor movement is within the program guide screen being displayed on the display unit 8 (Step 11).

[0044]

If the position of the destination of the cursor movement is within the program guide screen being displayed on the display unit 8, the cursor image within the display memory is moved so that the cursor is displayed at the position of the destination of movement (Step 12).

[0045]

If the position of the destination of the cursor movement is outside the program guide screen being displayed on the display unit 8, the slot corresponding to the position of the

destination of cursor movement is set as the reference slot to change (scroll) the program guide screen (Step 13). Then, the operation returns to Step 2. Accordingly, the display table shown in Fig. 2 is created on the basis of the newly set reference slot, and a new program guide screen is displayed on the display unit 8. Namely, the program guide screen is updated.

[0046]

Fig. 4 shows a detailed procedure of program-guide-image generation processing in Step 3 shown in Fig. 3.

[0047]

In this program-guide-image generation processing, as shown in Fig. 5, a program guide image is generated in which a time zone in which purchased programs are present and a time zone in which purchased programs are not present are displayed by being classified by coloring.

[0048]

First, a frame image of a size corresponding to the number of its exclusively occupied slots is written in the display memory for each program within the display table (Step 21). Then, 1 is set in a variable SLOT-NUM which indicates a relative slot number (Step 22).

[0049]

A determination is made as to whether or not a purchased program is present in the time zone corresponding to the presently set variable SLOT-NUM (Step 23). If it is determined

that a purchased program is not present in the time zone corresponding to the presently set variable SLOT-NUM, color data representing a first color is written in the region of the time zone corresponding to the presently set variable SLOT-NUM in the inner regions of all the frames which have been written in the display memory (Step 24). Then, the operation proceeds to Step 26.

[0050]

In Step 23, if it is determined that a purchased program is present in the time zone corresponding to the presently set relative slot number SLOT-NUM, color data representing a second color different from the first color is written in the region of the time zone corresponding to the presently set variable SLOT-NUM in the inner regions of all the frames which have been written in the display memory (Step 25). Then, the operation proceeds to Step 26.

[0051]

In Step 26, the variable SLOT-NUM is incremented by 1. That is, the variable SLOT-NUM is updated. Then, a determination is made as to whether or not the updated variable SLOT-NUM is greater than 5 (Step 27). If the updated variable SLOT-NUM is less than or equal to 5 (NO in Step 27), the operation returns to Step 23, and processing in Steps 23 to 26 is executed again with respect to the time zone corresponding to the updated variable SLOT-NUM. If processing in Steps 23 to 26 is thus

executed with respect to each of the relative slot numbers 1 to 5, YES is given as the answer in Step 27, and the operation proceeds to Step 28.

[0052]

In Step 28, a cursor image is written in the display memory. Subsequently, an image representing a title (title image) is written in each frame (Step 29), whereupon the program-guide-image generation processing ends.

[0053]

Fig. 5 shows an example of the program guide screen displayed on the display unit 8 on the basis of the program guide image thus formed. Fig. 5 shows an example in which already purchased programs are present in the time zone 9:00 to 10:00. Accordingly, the interiors of the program frames in the time zone 9:00 to 10:00 are colored in the second color (shown by hatching), and the interiors of the program frames in other time zones are colored in the first color (shown by black spaces).

[0054]

Thus, in the above-described embodiment, since the time zone in which purchased programs are present and the time zone in which purchased programs are not present are classified by coloring in the program guide screen, the user is able to immediately know the time zone in which the purchased programs are present through the program guide screen. For this reason,

it is possible to prevent two or more programs from being purchased by mistake during the same time zone.

[0055]

Incidentally, if an already purchased program is present among the programs which are written in the display memory, color data representing a third color different from the first and second colors may be written within the frame of that program.

[0056]

Fig. 6 shows another example of the program-guide-image generation processing.

[0057]

In this program-guide-image generation processing, programs which have been purchased and programs which have not been purchased are classified by coloring, and a program guide image is generated in which the time zone in which the purchased programs are present is indicated by triangular marks (▲, ▼), as shown in Fig. 7.

[0058]

First, a frame image of a size corresponding to the number of exclusively occupied slots of the program within the display table is written in the display memory (Step 31).

[0059]

Next, the color data representing the first color is written in the frames corresponding to the programs which have

not been purchased among all the frames which have been written in the display memory, while the color data representing the second color different from the first color is written in the frames corresponding to the programs which have been purchased (Step 32). If a purchased program is not present among the programs which are to be displayed in the display region, the color data representing the first color is written in the interiors of all the frames which have been written in the display memory.

[0060]

Next, after the cursor image is written in the display memory (Step 33), a title image is written in each frame (Step 34).

[0061]

Next, 1 is set in the variable SLOT-NUM which indicates the relative slot number (Step 35). Then, a determination is made as to whether or not any purchased program is present in the time zone corresponding to the presently set variable SLOT-NUM (Step 36). If it is determined that a purchased program is not present in the time zone corresponding to the presently set variable SLOT-NUM, the operation proceeds to Step 41.

[0062]

If it is determined that a purchased program is present in the time zone corresponding to the presently set variable SLOT-NUM, a determination is made as to whether or not the

purchased program is present in the display region (Step 37).
If the purchased program is present in the display region, the
operation proceeds to Step 41.

[0063]

If a purchased program is not present in the display
region, a determination is made as to whether or not that
purchased program is located upwardly of the display region
(Step 38). If it is determined that the purchased program is
located upwardly of the display region (YES in Step 38), an
image corresponding to the upward oriented triangular mark ▲
is written in the display memory so that the upward oriented
triangular mark ▲ will be displayed in an upper region of the
display screen, this region being the region of the time zone
corresponding to the presently set relative slot number
SLOT-NUM (Step 39). Then, the operation proceeds to Step 41.

[0064]

If it is determined that the purchased program is not
located upwardly of the display region (NO in Step 38), a
determination is made that the purchased program is located
downwardly of the display region. Accordingly, in this case,
an image corresponding to the downward oriented triangular mark
is written in the display memory so that the downward oriented
triangular mark ▼ will be displayed in a lower region of the
display screen, this region being the region of the time zone
corresponding to the presently set relative slot number

SLOT-NUM (Step 40). Then, the operation proceeds to Step 41.
[0065]

In Step 41, the variable SLOT-NUM is incremented by 1. That is, the variable SLOT-NUM is updated. Then, a determination is made as to whether or not the updated variable SLOT-NUM is greater than 5 (Step 42). If the updated variable SLOT-NUM is less than or equal to 5 (NO in Step 42), the operation returns to Step 36, and processing in Steps 36 to 41 is executed again with respect to the time zone corresponding to the updated variable SLOT-NUM. If processing in Steps 36 to 41 is thus executed with respect to each of the relative slot numbers 1 to 5, YES is given as the answer in Step 27, and the program-guide-image generation processing ends.

[0066]

Fig. 7 shows an example of the program guide screen displayed on the display unit 8 on the basis of the program guide image thus formed. In this example, the upward oriented triangular mark ▲ is displayed at the time zone 9:00 to 9:30, and the downward oriented triangular mark ▼ is displayed at the time zone 9:30 to 10:00. In addition, a program during 10:00 to 11:00 on channel 6 (title: I) is colored in the second color.

[0067]

Namely, during the time zone of 9:00 to 9:30, an already purchased program is present on the channel which is located upwardly of the channels being displayed. In addition, during

the time zone of 9:30 to 10:00, an already purchased program is present on the channel which is located downwardly of the channels being displayed. Further, the program during 10:00 to 11:00 on channel 6 (title: I) is an already purchased program.

[0068]

In this embodiment, programs which have been purchased and programs which have not been purchased are displayed on the program guide screen by being classified by coloring, and the time zone in which a purchased program is located upwardly of the display screen and the time zone in which a purchased program is located downwardly of the display screen are displayed by the triangular marks. Accordingly, the user is able to immediately know the time zone in which the purchased programs are present through the program guide screen. For this reason, it is possible to prevent two or more programs from being purchased by mistake during the same time zone. In addition, if the triangular mark is displayed, the user is able to know if the purchased program is on the channel located upwardly or downwardly of the program guide screen being presently displayed, so that it is easy to search a purchased program through the operation of the cursor.

[0069]

Fig. 8 shows still another example of the program-guide-image-generation processing.

[0070]

In this program-guide-image generation processing, a program guide image is generated in which the time zone in which the purchased programs are present is indicated by a bar, as shown in Fig. 9.

[0071]

First, a frame image of a size corresponding to the number of exclusively occupied slots of the program within the display table is written in the display memory (Step 51).

[0072]

Next, color data representing a predetermined color is written in all the frames which have been written in the display memory (Step 52). Incidentally, if an already purchased program is present among programs which are written in the display memory, the color data representing the first color may be written in the frames corresponding to the programs which have not been purchased among all the frames which have been written in the display memory, while the color data representing the second color different from the first color may be written in the frames corresponding to the programs which have been purchased.

[0073]

Next, after the cursor image is written in the display memory (Step 53), a title image is written in each frame (Step 54).

[0074]

Next, 1 is set in the variable SLOT-NUM which indicates the relative slot number (Step 55). Then, a determination is made as to whether or not any purchased program is present in the time zone corresponding to the presently set variable SLOT-NUM (Step 56). If it is determined that a purchased program is not present-in the time zone corresponding to the presently set variable SLOT-NUM, the operation proceeds to Step 58.

[0075]

If it is determined that a purchased program is present in the time zone corresponding to the presently set relative slot number SLOT-NUM, an image corresponding to a bar is written in the display memory so that the bar will be displayed in an upper region of the display screen, this region being the region of the time zone corresponding to the presently set relative slot number SLOT-NUM (Step 57). Then, the operation proceeds to Step 58.

[0076]

In Step 58, the variable SLOT-NUM is incremented by 1. That is, the variable SLOT-NUM is updated. Then, a determination is made as to whether or not the updated variable SLOT-NUM is greater than 5 (Step 59). If the updated variable SLOT-NUM is less than or equal to 5 (NO in Step 59), the operation returns to Step 56, and processing in Steps 56 to 58 is executed again with respect to the time zone corresponding to the updated

variable SLOT-NUM. If processing in Steps 56 to 58 is thus executed with respect to each of the relative slot numbers 1 to 5, YES is given as the answer in Step 59, and the program-guide-image generation processing ends.

[0077]

Fig. 9 shows an example of the program guide screen displayed on the display unit 8 on the basis of the program guide image thus formed. In this example, the bar is displayed in the upper region of the program guide screen, this region corresponding to the time zone 9:00 to 10:00. Namely, an example is shown in which a purchased program is present in the time zone 9:00 to 10:00.

[0078]

In this embodiment, since the time zone in which a purchased program is present is indicated by the bar on the program guide screen, it is possible to prevent two or more programs from being purchased by mistake during the same time zone.

[0079]

[Effect of the Invention]

According to this invention, a situation is difficult to occur in which two or more PPV programs broadcast during the same time zone are purchased.

[BRIEF DESCRIPTION OF THE DRAWINGS]

Fig. 1 is a block diagram illustrating a configuration

of a user-side terminal.

Fig. 2 is a diagram illustrating a display table.

Fig. 3 is a flowchart illustrating an overall processing procedure for displaying a program guide screen.

Fig. 4 is a flowchart illustrating a detailed procedure of program-guide-image generation processing in Step 3 shown in Fig. 3.

Fig. 5 is a diagram illustrating an example of the program guide screen displayed on the basis of a program guide image formed by processing in Fig. 4.

Fig. 6 is a flowchart illustrating another example of the program-guide-image generation processing.

Fig. 7 is diagram illustrating an example of the program guide screen displayed on the basis of the program guide image formed by processing in Fig. 6.

Fig. 8 is a flowchart illustrating still another example of the program-guide-image generation processing.

Fig. 9 is diagram illustrating an example of the program guide screen displayed on the basis of the program guide image formed by processing in Fig. 8.

Fig. 10 is a diagram illustrating the program guide screen displayed on the user-side terminal in DSS.

[Description of Reference Numerals and Signs]

2 Tuner

3 Video processing circuit

4. Program guide image generation circuit
- 5 Operation unit
- 6 CPU
- 7 Multiplexer
- 8 Display unit
- 9 Storage device

[Name of Document] ABSTRACT

[Abstract]

[Object]

It is an object of this invention to provide a program guide display controlling apparatus to ensure that a situation in which two or more PPV programs which are broadcast during the same time zone happen to be purchased is made difficult to occur.

[Means to Achieve the Object]

A program-guide-display controlling apparatus for displaying a plurality of program guides on a display unit in a matrix form by using one of the ordinate and the abscissa as a channel number axis and another one as a time axis comprising means for displaying to discriminate a time zone in which a purchased program is present and a time zone in which the purchased program is not present.

[Selected Drawing] Fig. 1



RECEIVED

AUG 2 2000

Group 2700

FIG. 1

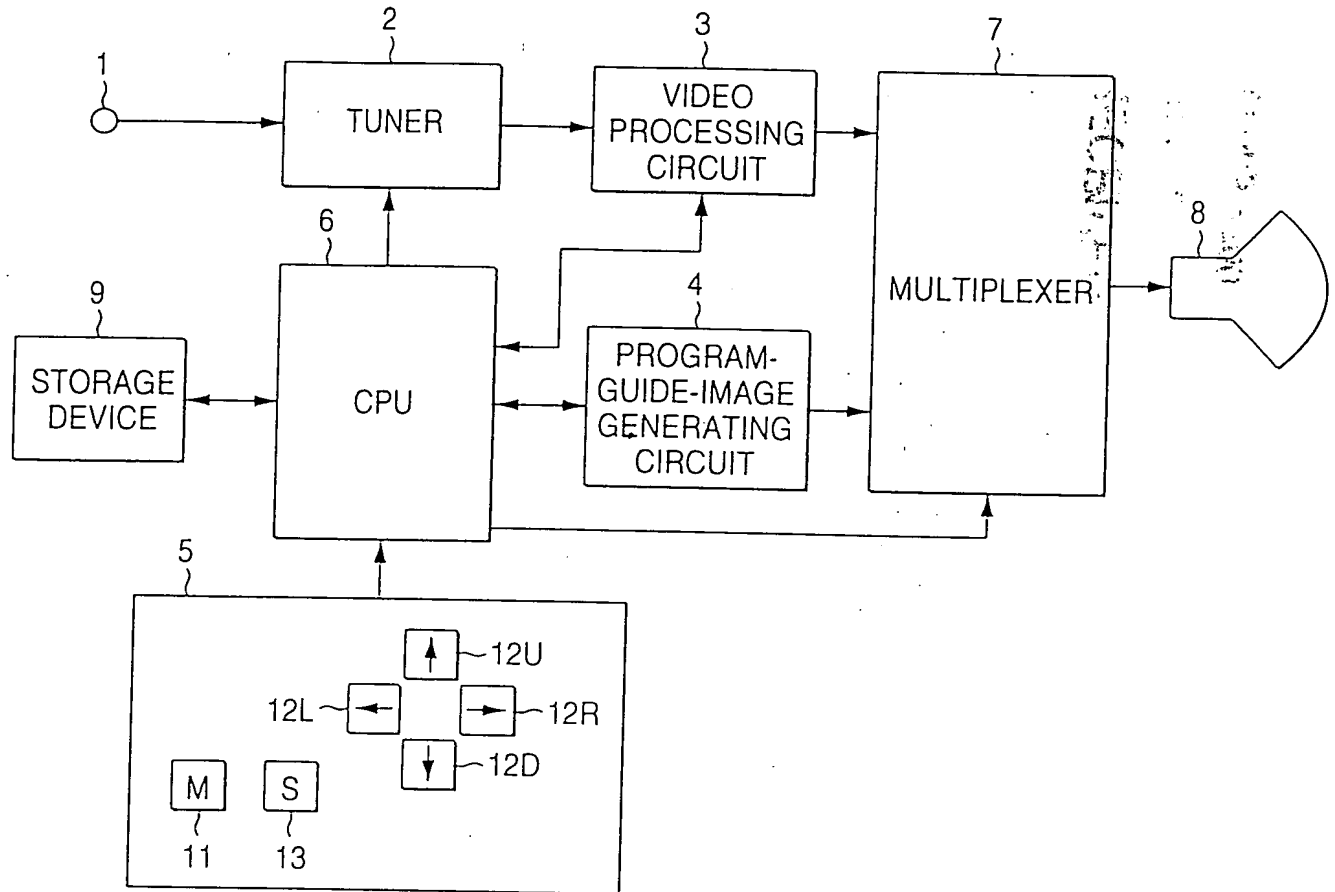


FIG. 2

So

(1, 0)	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)
(2, 0)	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)
(3, 0)	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)
(4, 0)	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)
(5, 0)	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)

FIG. 3

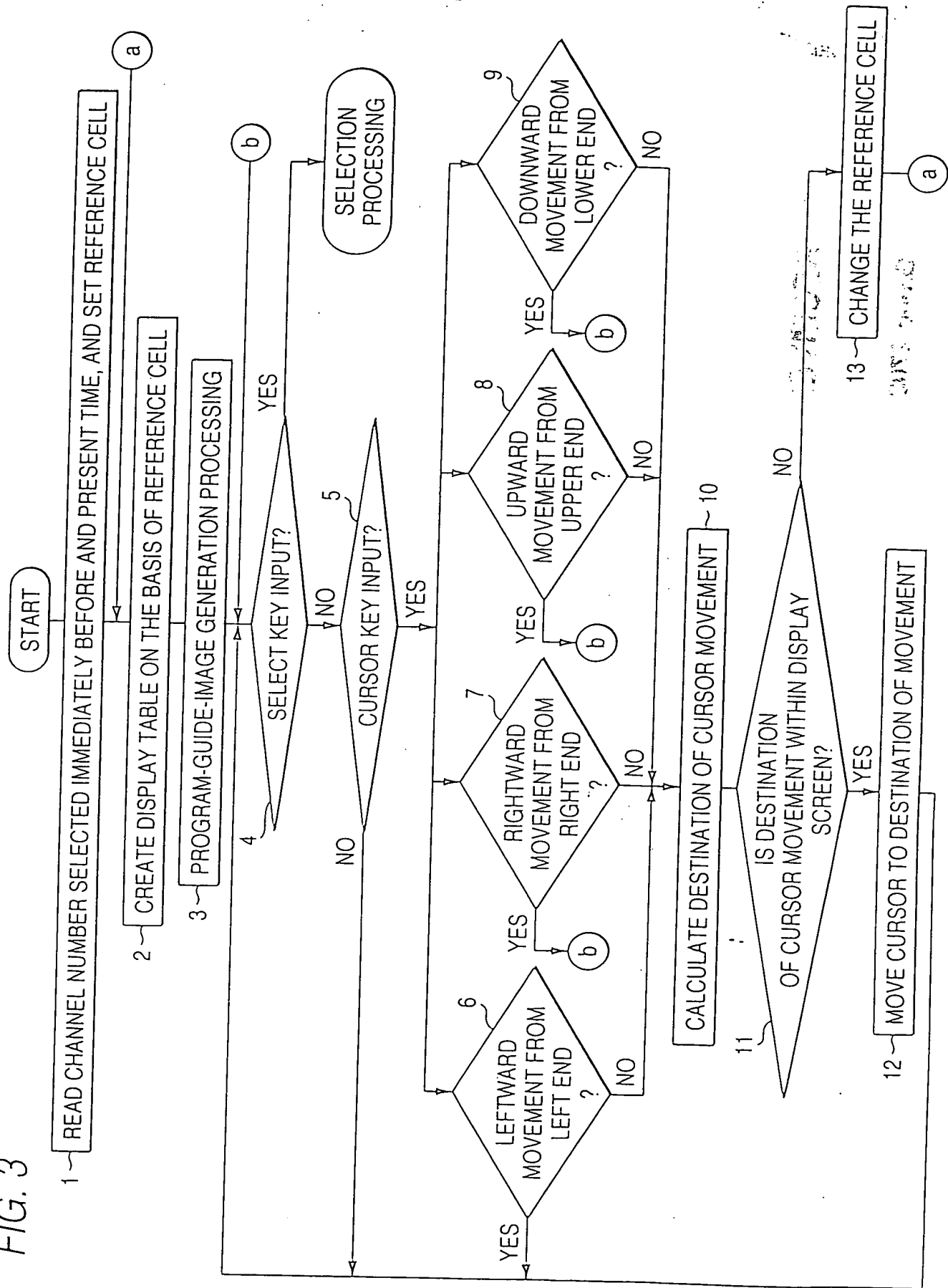


FIG. 4

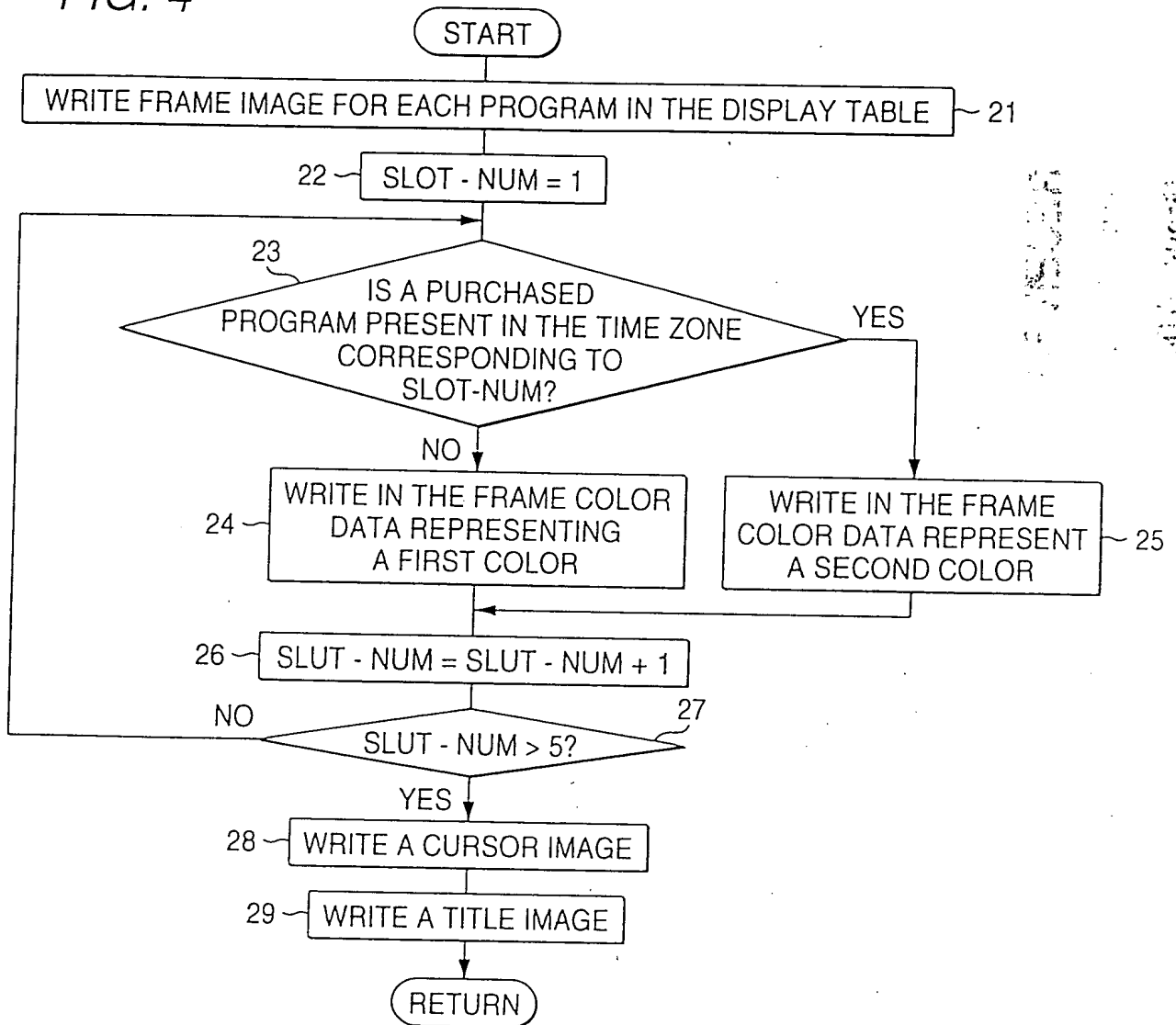


FIG. 5

	9:00	9:30	10:00	10:30	11:00
CH. 2	A		B		
CH. 4	C	D	E	F	G
CH. 6	H		I		J
CH. 8	K	L	M		
CH. 10	N		O	P	

FIG. 6

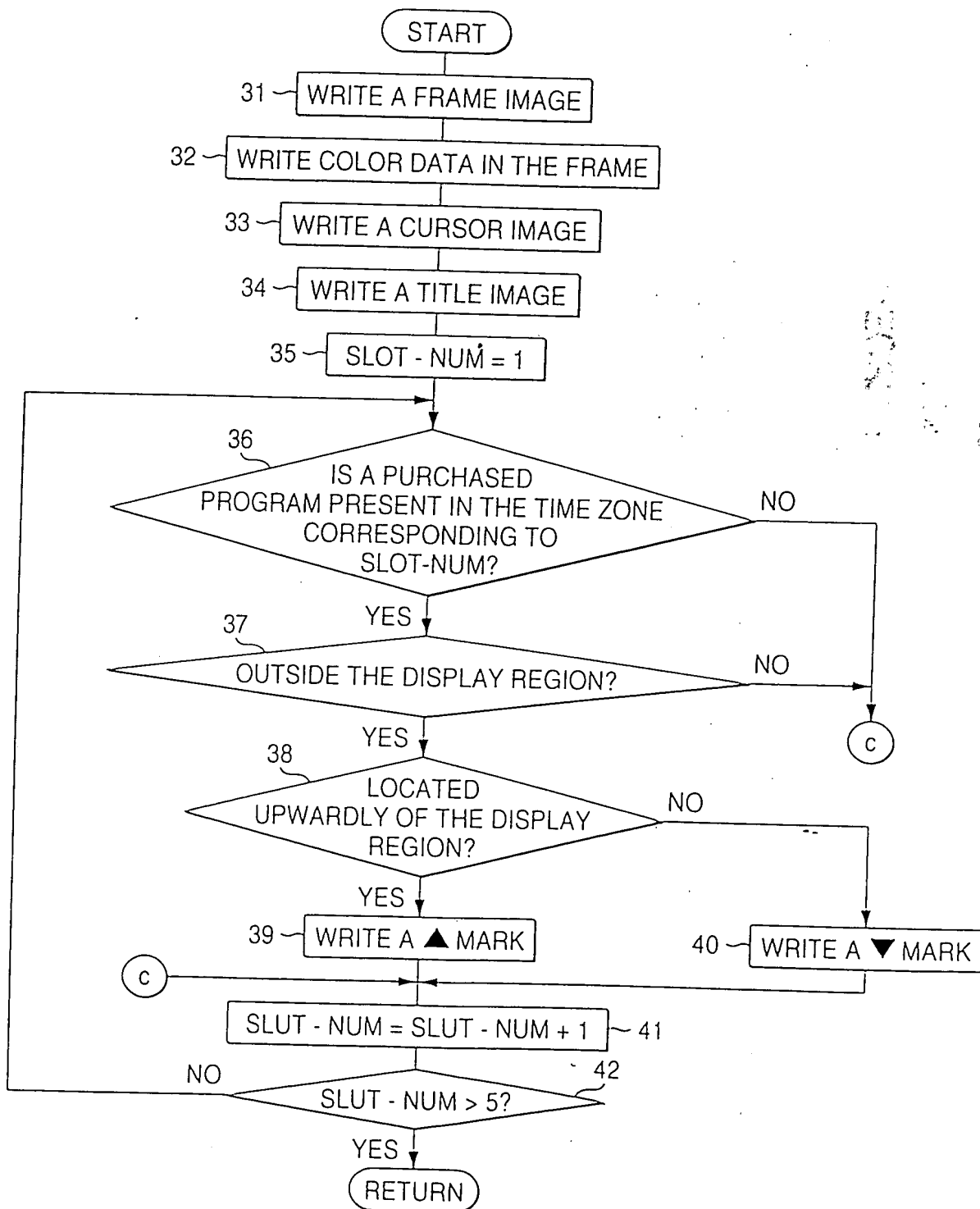


FIG. 7


	9:00	9:30	10:00	10:30	11:00
	▲				
CH. 2	A		B		
CH. 4	C	D	E	F	G
CH. 6	H				J
CH. 8	K	L		M	
CH. 10	N		O	P	
	▼				

FIG. 8

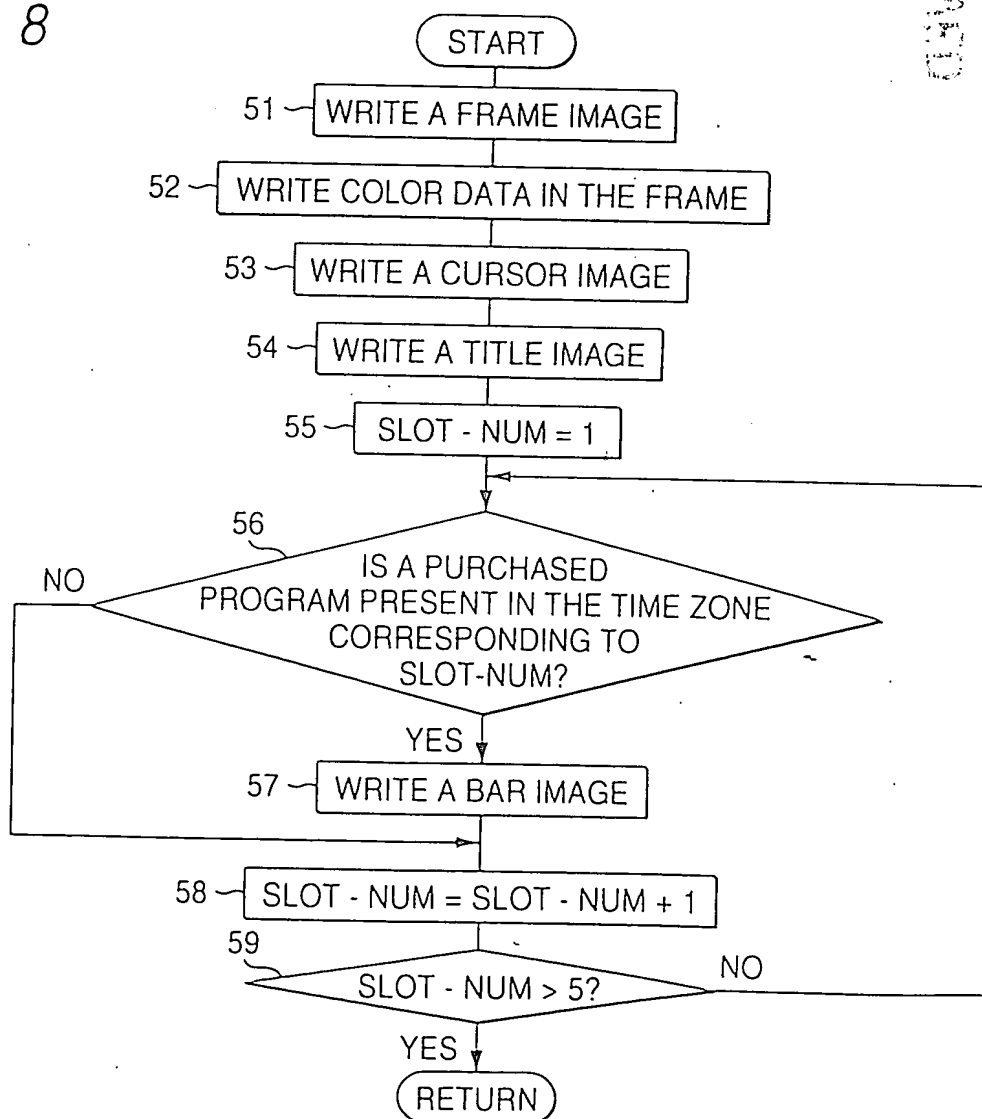
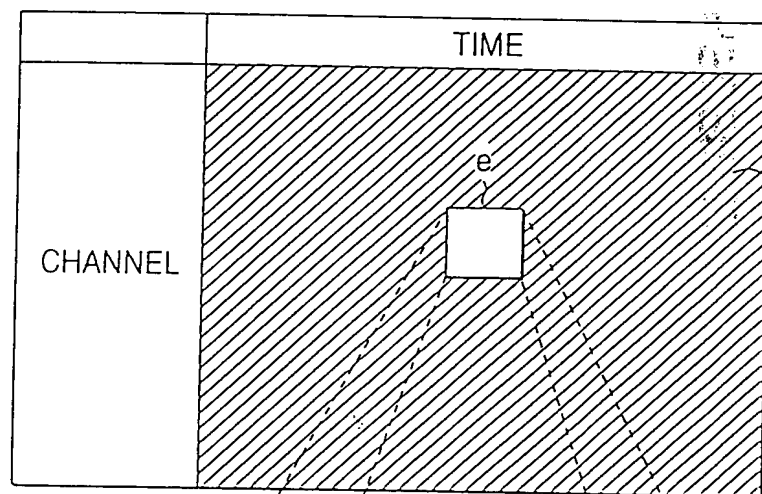


FIG. 9

	9:00	9:30	10:00	10:30	11:00
CH. 2	A		B		
CH. 4	C	D	E	F	G
CH. 6	H		I		J
CH. 8	K	L		M	
CH. 10	N		O	P	

FIG. 10



	9:00	9:30	10:00	10:30	11:00
CH. 2	A		B		
CH. 4	C	D	E	F	G
CH. 6	H		I		J
CH. 8	K	L		M	
CH. 10	N		O	P	